AMENDMENTS

Amendments to the Specification begin on page 2 of this paper.

Amendments to the Claims are reflected in the listing of claims that begins on page 8 of this paper.

Remarks/Arguments begin on page 14 of this paper.

AMENDMENTS TO THE SPECIFICATION

In the Abstract of the Disclosure:

Please replace the Abstract of the Disclosure, page 14, paragraph [0022], with the following rewritten paragraph:

[0022] New and improved compositions of doped fluorophosphate glasses for lasers have a high refractive index (nD) of approximately 1.6 to 1.7, high transmission in the near infrared part of the spectrum and a wide glass forming domain. These glass systems, ~~Ba(PO3)2~~$Ba(PO_3)_2$ - ~~Al(PO3)3~~$Al(PO_3)_3$ - ~~BaF2~~BaF_2 - Dopants, utilize dopants from the group of oxides or fluorides of the rare earth elements Nd, Er, Yb, Tm, Tb, Ho and Pr as well as MnO and mixtures thereof. The composition of glass includes chemical durability, efficiency of laser use in the infrared spectrum and improved duration of luminescence. It is emphasized that this abstract is provided to comply with the rules requiring an abstract that will allow a searcher or other reader to quickly ascertain the subject matter of the technical disclosure. It is submitted with the understanding that it will not be used to interpret or limit the scope or meaning of the claims.

A1

In the Specifications:

Please delete the paragraph beginning on page 3, number [0011] and the heading at line 20,

"BRIEF DESCRIPTION OF THE DRAWINGS".

Please replace the paragraph beginning on page 1, number [0001], with the following rewritten paragraph:

[0001] Field of Invention: This invention relates to novel compositions of doped fluorophosphates glass. The new and improved glass compositions are particularly useful in laser glass, amplifiers and high density optical storage applications and are based on or contain ~~Ba(PO3)2~~$Ba(PO_3)_2$, ~~Al(PO3)3~~$Al(PO_3)_3$, ~~BaF2~~BaF_2 or related fluorides and MnO or ~~R2O3~~R_2O_3 where R is from the group Nd, Er, Tm, Ho, Pr, Tb, Yb, Sm and Eu.

Please replace the paragraph beginning on page 1, number [0002] with the following rewritten paragraph:

[0002] Description of Related Art: Presently most optical laser glasses are manufactured on a ~~SiO2~~SiO_2 base. The ~~SiO2~~SiO_2 based laser glasses have a limited refractive index of nD = 1.40 to 1.45 and a limited infrared transmission spectrum. These limitations prohibit use of ~~SiO2~~SiO_2 based glasses in applications for modern laser applications such as the need for glass with efficient transparency in the near and mid infrared frequency range.

Please replace the paragraph beginning on page 1, number [0004], with the following rewritten paragraph:

[0004] Fluorophosphate glasses are close to the phosphate glasses in terms of the degree of covalence of the dopant-ligand bond. This has been confirmed by comparison of the Racha coefficient, B, for these glasses. The magnitude of B decreases with a decrease in size of the effective nuclear charge of free ions. The boundaries of glass formation for fluorophosphate glasses with metaphosphates of barium and aluminum and with fluorides of alkaline earth elements create a wide domain of glass forming fluorophosphates that increase in the following order Ba > Sr > Ca > Mg. The presence of barium fluoride, ~~BaF2~~BaF_2, with RFx where RFx is

from the group ~~MgF2~~MgF_2, ~~CaF2~~CaF_2, ~~PbF2~~PbF_2 and ~~BiF3~~BiF_3 effectively increases chemical durability of laser materials.

A3 Cont

Please replace the paragraph beginning on page 2, number [0006], with the following rewritten paragraph:

[0006] Existing fluorophosphates laser glass such as the system ~~Ba-PO3F~~$BaPO_3F$ - ~~MgF2~~MgF_2 - ~~Nd2O3~~Nd_2O_3 - ~~Ga2O3~~Ga_2O_3 - MnO have a high rate of inactive absorption of wavelength 1,064 nm, which reduces the luminescence of glass dopants. There also exist a class of fluorophosphate laser glasses that were developed on a base of metaphosphate aluminum and fluorides of metal from the first and second group of the periodic elements. The optical constant for these glasses are in the range (nD) from 1.45 to 1.59 whereas the instant invention exceeds 1.60 for greater laser efficiency, U.S. Patent No.'s 2,511,225; 2,511,227; 2,481,700 and 2,430,539.

A4

Please replace the paragraph beginning on page 3, number [0009], with the following rewritten paragraph:

[0009] The fluorophosphate glass contains the components ~~Ba(PO3)2~~$Ba(PO_3)_2$, ~~Al(PO3)3~~$Al(PO_3)_3$, ~~BaF2~~BaF_2 and RFx where RFx is from the group ~~MgF2~~MgF_2, ~~CaF2~~CaF_2, ~~PbF2~~PbF_2 and ~~BiF3~~BiF_3 or related fluorides and MnO or ~~R2O3~~R_2O_3 where R is from the group Nd, Er, Tm, Ho, Pr, Tb, Sm, Eu and Yb. This composition of glass has a high level of chemical durability, laser efficiency and luminescence of dopants.

A5

Please replace the paragraph beginning on page ~~4~~ 5, number [0013], with the following rewritten paragraph:

[0013] The preferred material for the present invention are glasses based on or containing

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~~Ba(PO3)2~~$Ba(PO_3)_2$, 10 to 60 mol %; ~~Al(PO3)3~~$Al(PO_3)_3$, 10 to 60 mol %; ~~BaF2~~BaF_2 + RFx, 20 to 90 mol %; and MnO or ~~R2O3~~R_2O_3, 2 to 20 weight %, where R is from the group Nd, Er, Tm, Ho, Pr, Tb, Sm, Eu and Yb. The raw compounds used for glass formation are: Metaphosphate Barium, ~~Ba(PO3)2~~$Ba(PO_3)_2$, and Aluminum, ~~Al(PO3)3~~$Al(PO_3)_3$, which are considered chemically stable substances. When MnO or ~~Yb2O3~~Yb_2O_3 are used as co-dopant sensitizers the range of dopant is 1 to 20 weight %.

Please replace the paragraph beginning on page 4, number [0016], with the following rewritten paragraph:

[0016] The preferred glass forming compounds, ~~Ba(PO3)2~~$Ba(PO_3)_2$ and ~~Al(PO3)3~~$Al(PO_3)_3$ are characterized as chemically stable substances. In combination they create a significant free or open volume structure due to the large ionic radii of barium (1.38°A) as in ~~Ba(PO3)2~~$Ba(PO_3)_2$ and BaF_2 + RFx. This allows the homogenous and regular distribution of dopant ions in a glass ~~matrice~~matrix.

Please replace the paragraph beginning on page 4, number [0017], with the following rewritten paragraph:

[0017] The presence of BaF_2 + RFx effectively increases the chemical durability of the laser material. In the grouping of glasses according to chemical stability of non-silicate glasses relating to humidity or moisture, these glasses are considered to be stable glasses. During the melting process a chemical integration between ~~Ba(PO3)2~~$Ba(PO_3)_2$ and ~~BaF2~~BaF_2 creates ~~BaPO3F~~$BaPO_3F$, monofluorophosphate barium.

Please replace the paragraph beginning on page 5, number [0018], with the following rewritten paragraph:

[0018] The melting process is conducted in the temperature range of 1,200°C to 1,250°C in vitreous carbon crucibles in a dry argon atmosphere for 4 to 5 hours followed by an annealing temperature range of 320°C to 340°C for 8 to 10 hours. In the system of ~~Ba(PO3)2~~$Ba(PO_3)_2$ - ~~Al(PO3)3~~$Al(PO_3)_3$ - ~~BaF2~~BaF_2 - RFx with dopants R, including sensitizers MnO and ~~Yb2O3~~Yb_2O_3, two separate glass forming ranges were discovered as illustrated in Table I.

G9

Please replace the TABLE I beginning on page 5, line 10, with the following rewritten TABLE I:

TABLE I

G10

Range I (in mol %)		
~~Ba(PO3)2~~$Ba(PO_3)_2$	~~Al(PO3)3~~$Al(PO_3)_3$	~~BaF2~~BaF_2 + RFx
0 -100	0 -100	5 - 30
Range II (in mol %)		
~~Ba(PO3)2~~$Ba(PO_3)_2$	~~Al(PO3)3~~$Al(PO_3)_3$	~~BaF2~~BaF_2 + RFx
0 - 45	5 - 30	45 - 90

Please replace the paragraph beginning on page 5, number [0019], with the following rewritten paragraph:

[0019] Examples of effective compositions and properties of the fluorophosphates laser glass for the composition ~~Ba(PO3)2~~$Ba(PO_3)_2$ - ~~Al(PO3)3~~$Al(PO_3)_3$ - ~~BaF2~~BaF_2 - RFx - ~~Nd2O3~~Nd_2O_3 - ~~Er2O3~~Er_2O_3 are illustrated in Table II based on mol percent and weight percent.

G11

Please replace the TABLE II beginning on page 6, line 1, with the following rewritten TABLE II:

TABLE II

Composition of Glass (mol %)			Dopands (wt %)		Refractive	Density	Quantum Yield (%)
~~$Ba(PO_3)_2$~~ $Ba_2(PO_3)_2$	~~$Al(PO_3)_3$~~ $AlPO_4$	BaF_2 ~~$BaF2$~~ +RFx	Nd_2O_3 ~~Nd2O3~~	Er_2O_3 ~~Er2O3~~	Index(nD)	(g/cm^3)	Luminescence
40	48	10	2		1.6345	3.35	45
35	13	50	2		1.6385	3.38	60
28	10	60	2		1.6401	3.40	65
10	18	70	10		1.6412	3.45	70
40	48	10		2	1.6344	3.35	50
35	13	50		2	1.6386	3.36	63
28	10	60		2	1.6403	3.41	66
10	18	70		20	1.6410	3.43	75
5	5	90		5			

Please replace the paragraph beginning on page 6, number [0020], with the following rewritten paragraph:

[0020] In ~~this example~~ the examples of TABLE II MnO and ~~Yb2O3~~Yb_2O_3 would be used as dopant sensitizers.